Pacific Climate Change Science Program

Pacific Climate Change Data Portal – User Manual

Part 1: Website Guide

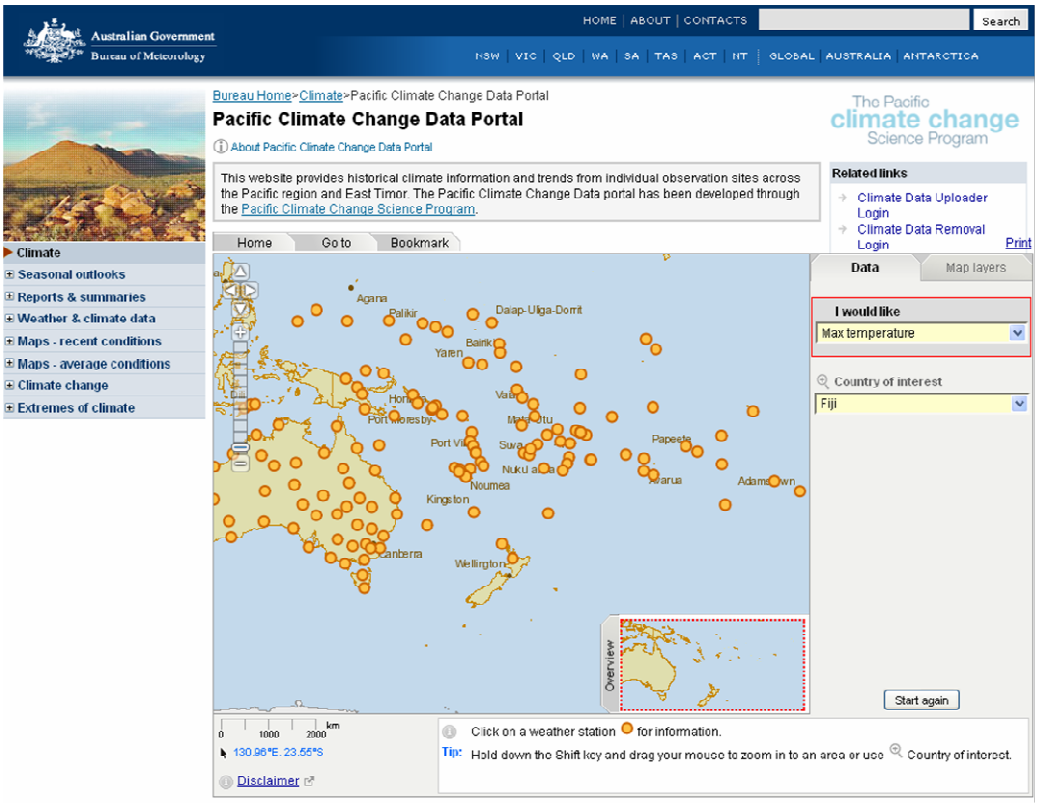
The Pacific Climate Change Data Portal provides an interface to examine historical climate information from 15 countries in the Pacific Ocean of the Southern Hemisphere. The portal displays climate data from the archives of each country, collated and homogenised by the Bureau of Meteorology.

The portal displays the records of monthly climate data in graphical format and also presents trends and averages for analysis of the data. The data files are available for download but are password protected.

This document provides an overview of the user interface and describes how to accomplish key tasks.

Accessing the Portal

Supported browsers:	Mozilla Firefox (preferred), Google Chrome or Internet Explorer
URL:	http://www.bom.gov.au/climate/pccsp/



Documentation produced by S. McGree and B. Campbell, 2011. This portal has been developed as part of the Pacific Climate Change Science Program, which is supported by the Australian Agency for International Development (AusAID), in collaboration with the Department of Climate Change and Energy Efficiency (DCCEE), and delivered by the Bureau of Meteorology and the Commonwealth Scientific and Industrial Research Organisation (CSIRO), through their research partnership in The Centre for Australian Weather and Climate Research (CAWCR).

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1. Overview of the map interface

The Pacific Climate Change Data Portal (Data Portal) map interface is divided into three main areas. The primary area is the *Data View Area* with two secondary areas, the *Navigation Tabs* and the *Side Panel*. The orientation of the Data Portal is displayed in Figure 1 below.

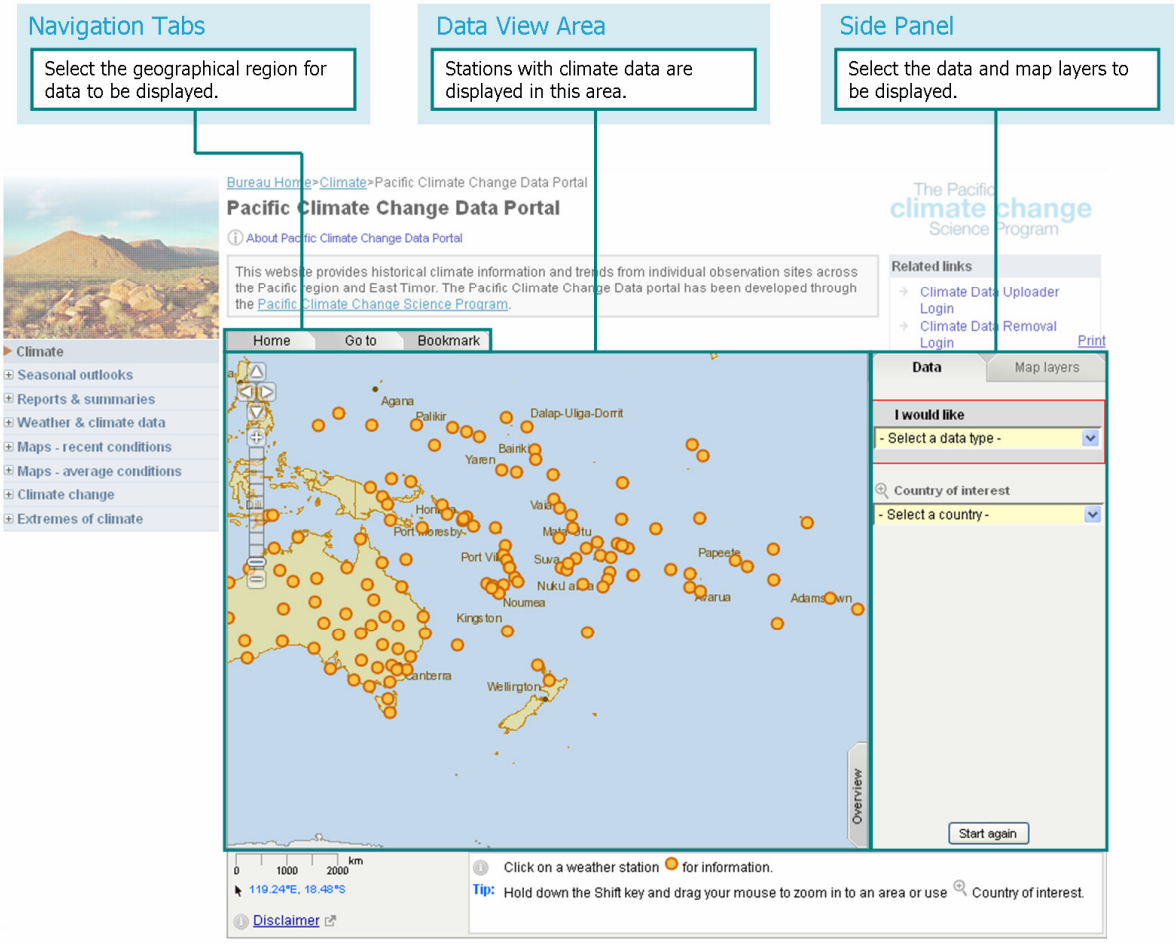

Figure 1: Orientation of the Pacific Climate Change Data Portal from the default view of the map interface.

1.1 Navigation Tabs

These tabs are used for navigation between the different regions which have stations included in the Data Portal.

1.1.1 Home tab

The “Go to home” option within this tab returns the zoom level to the default. There is also the option to save the changes made to the zoom level and position by selecting the “Set as home” option. To revert back to the default view after changes to the home page have been saved, select the “Clear home” option.

1.1.2 “Go to” tab

The “Go to” tab allows the selection of 23 different countries or regions across the Pacific Ocean. The selection of a country name from the “Go to” tab drop-down list will zoom the *Data View Area* to the region covered by that country.

1.1.3 Bookmark tab

This tab allows the Data Portal to be saved to the bookmarks of the user. There is also the option to copy and paste the link of the current view of the Data Portal for ease of sharing information.

1.2 Data View Area

The individual stations from each country which have climate data within the Data Portal are represented in the *Data View Area* by yellow shaded circles with an orange outline. The number of stations in each country varies.

Within the *Data View Area* the capital cities are specified by text overlayed on a map of the region.

The *Data View Area* displays a map by default. The "home" map view is one displaying the Pacific region from approximately 20°N – 70°S. Several utilities are provided within the *Data View Area* to aid navigation and interpretation when viewing the map. These features are highlighted in Figure 2 below.

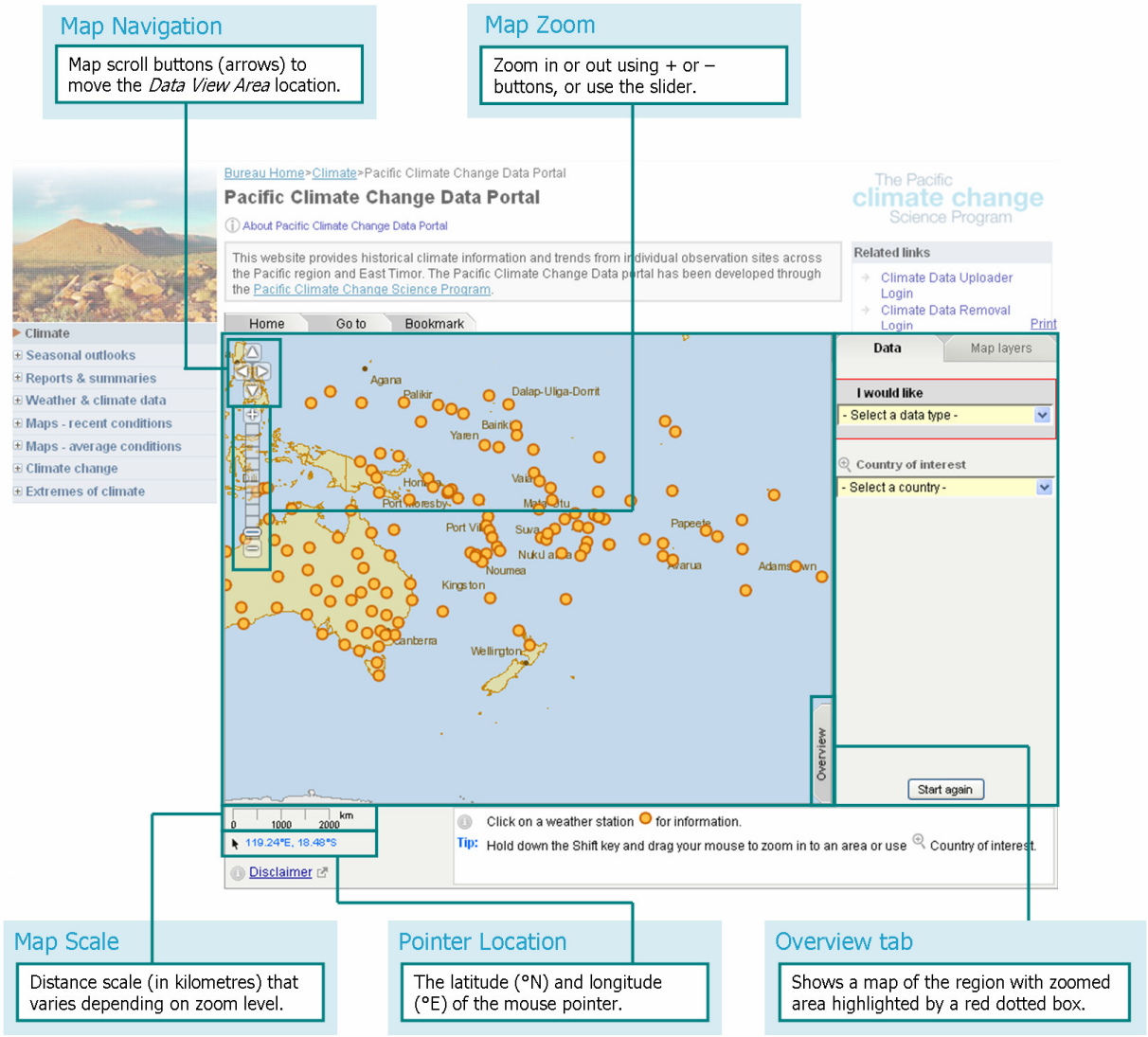

Figure 2: Navigation of the *Data View Area* from the default view.

1.2.1 Map Navigation

The arrow buttons allow navigation (scrolling) around the regional map. Navigation can also be achieved by using the mouse to drag the map around (click and hold the mouse button to drag the map).

1.2.2 Map Zoom

Nine levels of zoom are provided. To zoom in or out either click on the + or – buttons, or move the zoom slider. Zooming can also be achieved by scrolling with a mouse; double-clicking with a mouse will zoom-in one zoom level, centering the map on the location clicked.

1.2.3 Map Scale

A distance scale, in kilometres, is provided in the lower left panel of the map. The scale of the map varies depending on the zoom level selected.

1.2.4 Pointer Location

The current location of the mouse pointer within the *Data View Area* is displayed as latitude (°N) and longitude (°E) coordinates.

1.2.5 Overview tab

This tab provides an image of the entire region within the map and highlights (using a red doted outline) where the current *Data Area View* is located within the overall regional view.

1.3 Side Panel

The *Side Panel* provides two tabs (*Data* and *Map layers*) and is used to determine the data and features which are displayed in the *Data View Area*. The *Data* tab includes two drop-down menus to select which climate variable and country to display in the *Data View Area* and the *Map layers* tab includes a selection for background and map features. Selections available are described below.

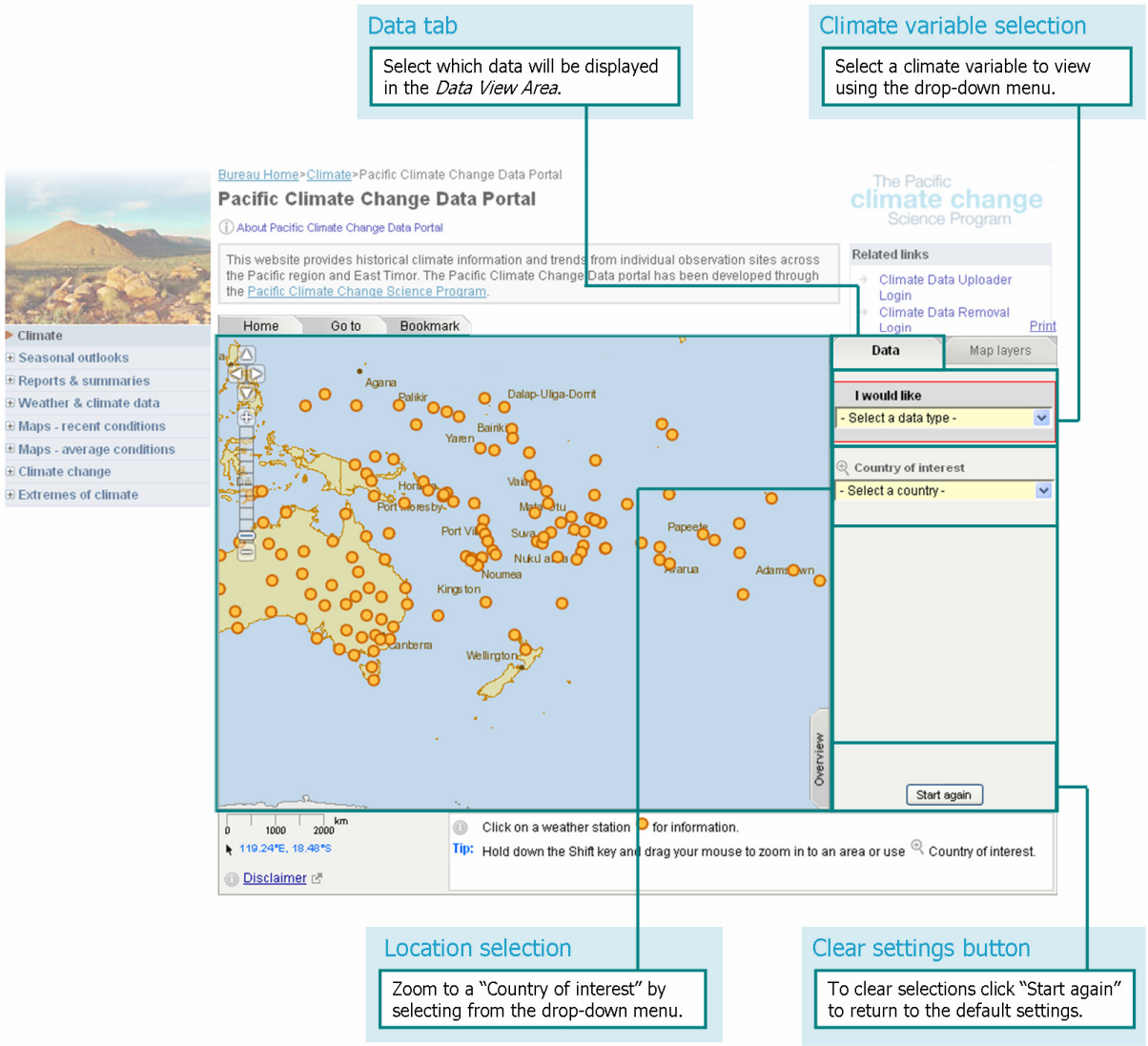

Figure 3: Features of the *Data* tab in the *Side Panel* of the Data Portal.

1.3.1 Data tab

Using the drop-down menus in the *Data* tab (Figure 3) it is possible to select the climatic variable and country of interest, with the display in the *Data View Area* representing the stations with observations of that climate variable.

1. **Climate variable selection**

The stations with records from the selected climate variable will be displayed in the *Data View Area*. There is a drop-down menu under "I would like" which allows the selection of a data type to display in the *Data View Area*. There is the option to select "Raw data" or "Homogenised data" for six different climate variables:

(i) Rainfall,
(ii) Maximum temperature,
(iii) Minimum temperature,
(iv) Mean temperature,
(v) Diurnal Temperature Range and
(vi) Mean Sea Level Pressure (MSLP).

The homogenised datasets are those which have been adjusted for non-climate related shifts in the record such as site changes. Some stations will only have raw data available as the homogenised datasets were created as part of the Pacific Climate Change Science Program and thus only the partner countries of this program will have homogenised data available through the Data Portal.

2. **Location selection**

Another feature of the *Data* tab is the ability to select a specific "Country of interest" from the drop-down menu. Selecting a country will zoom the *Data View Area* to that country and displays the stations which have records available for the chosen variable. If a variable has not been chosen, the map display will include all stations within the country with data records stored by the Data Portal. Depending on the level of zoom, this may also include stations from neighbouring countries.

3. **Clear settings button**

To clear the selections from the drop-down menus in the *Data* tab, click the "Start again" button to display the default settings in the *Data View Area* including removing options from the *Map layers* tab outlined in Section 1.3.2.

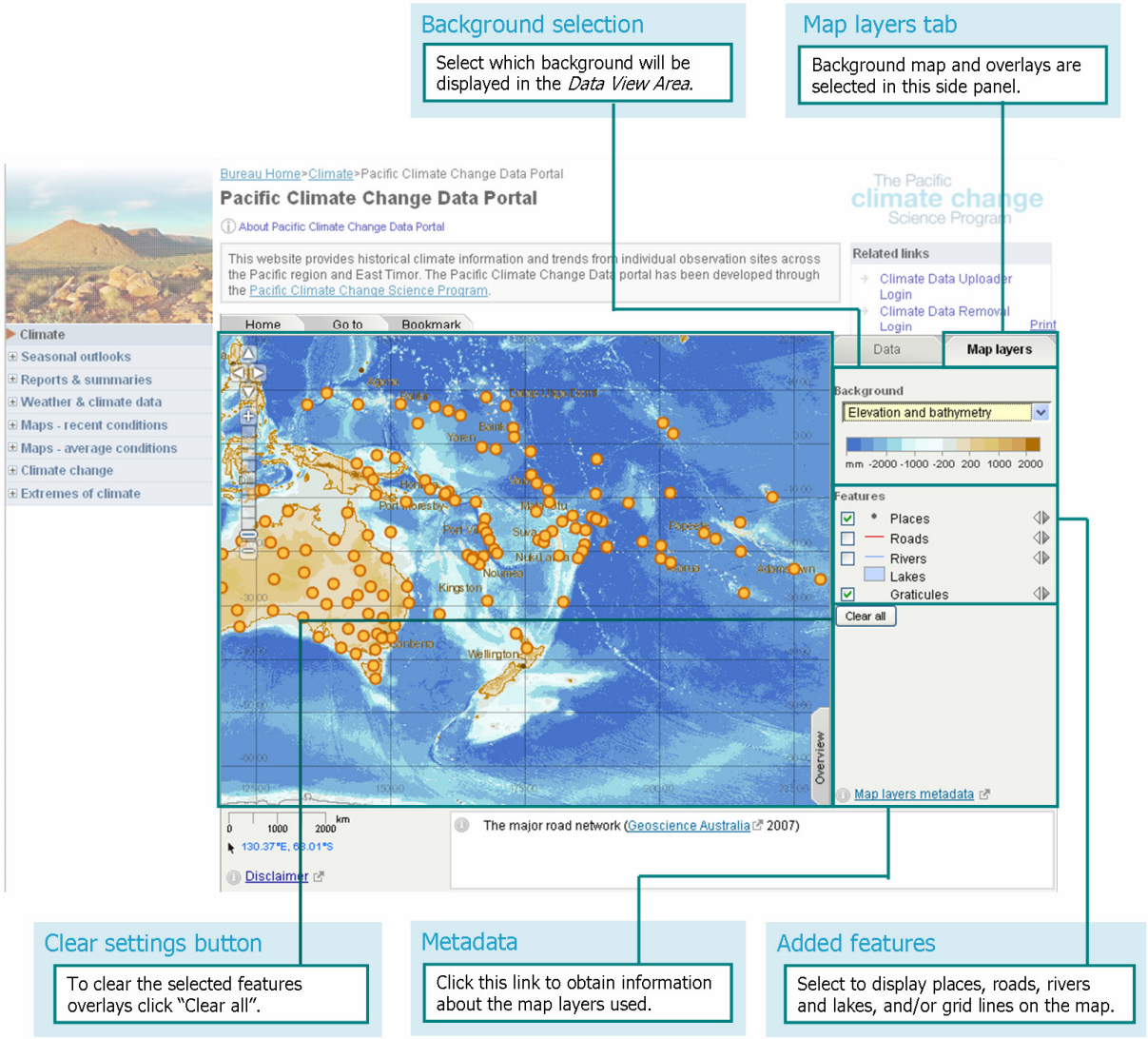

Figure 4: Features of the *Map layers* tab in the *Side Panel* of the Data Portal.

1.3.2 Map layers tab

The background map and various overlays can be selected in the *Map layers* tab (Figure 4).

1. **Background Selection**

The background map displayed in the *Data View Area* is selected in this drop-down menu. The map selected will form the background map to any station locations displayed in the *Data View Area*. The background maps available are:

- Basic: Landmasses and oceans are shaded; countries are outlined. This is the default map background.

- EEZ (Economic Exclusion Zones): Landmasses and oceans are shaded with countries outlined (as in the Plain background) with territorial waters denoted by gray shading and outlines.
- Elevation: Land elevation for the land masses of the region.
- Elevation and Bathymetry: Land elevation and ocean depth shaded for the region.

A colour key for the map is provided beneath the drop-down menu once the background selection has been made.

2. Added features

More information can be added to the map in the *Data View Area*, by checking or clearing the box in the 'Features' section on the *Map layers* tab. Available features include:

- Places: The names of capital cities and Australian state/territory capitals are displayed on the map with text accompanying a dot indicating the location.
- Roads: Displays the major road network across the Pacific according to Geoscience Australia 2007.
- Rivers and Lakes: Displays the main river network across the Pacific according to Geoscience Australia 2007.
- Graticules: A latitude and longitude grid at intervals that vary depending on the zoom-level selected is overlayed on the map when this option is selected.

It is possible to have all four features activated at once.

3. Clear settings button

To clear the selections from the 'Features' section in the *Map layers* tab, click the "Clear all" button to display only the map background and station locations in the *Data View Area*.

4. Metadata

This link provides information about the selection of map layers which have been used to create the display in the *Data View Area*. The link describes and provides reference for the background base layers as well as the overlays which can be selected from the *Map layers* tab.

1.5 Selecting a station from the map interface

To view the details of a specific station from the map interface including accessing the time series data for the variable selected in the *Side Panel*, click on the yellow dot in the *Data View Area* indicated in Figure 5 by the "Station Selection" instruction. Once selected the dot will become pink and enlarged to highlight which station has been selected. If the incorrect station has been selected click the ☒ button in the top right corner of the pop-up to return to the previous view.

Selecting a station will bring up a pop-up in the *Data View Area* with details of the selected site (Figure 5). The station pop-up will include the following site information:

(i) Station name and country,
(ii) WMO number,
(iii) Current status of the station – open or closed, and
(iv) Latitude and longitude of the site.

The "Show time series data" button at the bottom of the "Station pop-up" will bring up the time series of the climate variable selected in the *Side Panel* or the default (Rainfall (raw)) in a new window or tab. This view will be explained further in Section 2 which details the graphical interface of the Data Portal.

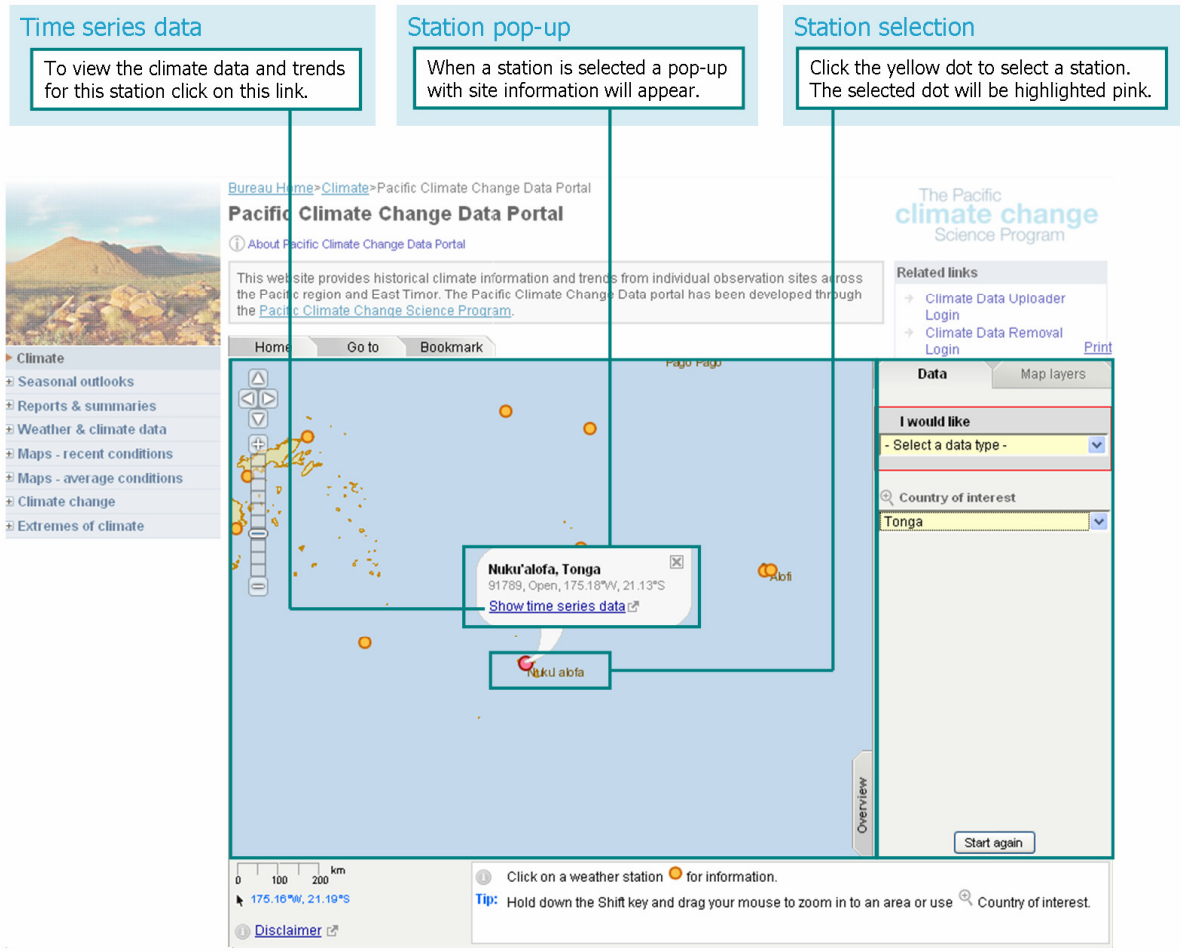

Figure 5: Using the map interface to access the graphical interface of the Data Portal via the “Station pop-up” functionality.

2. Overview of the graphical interface

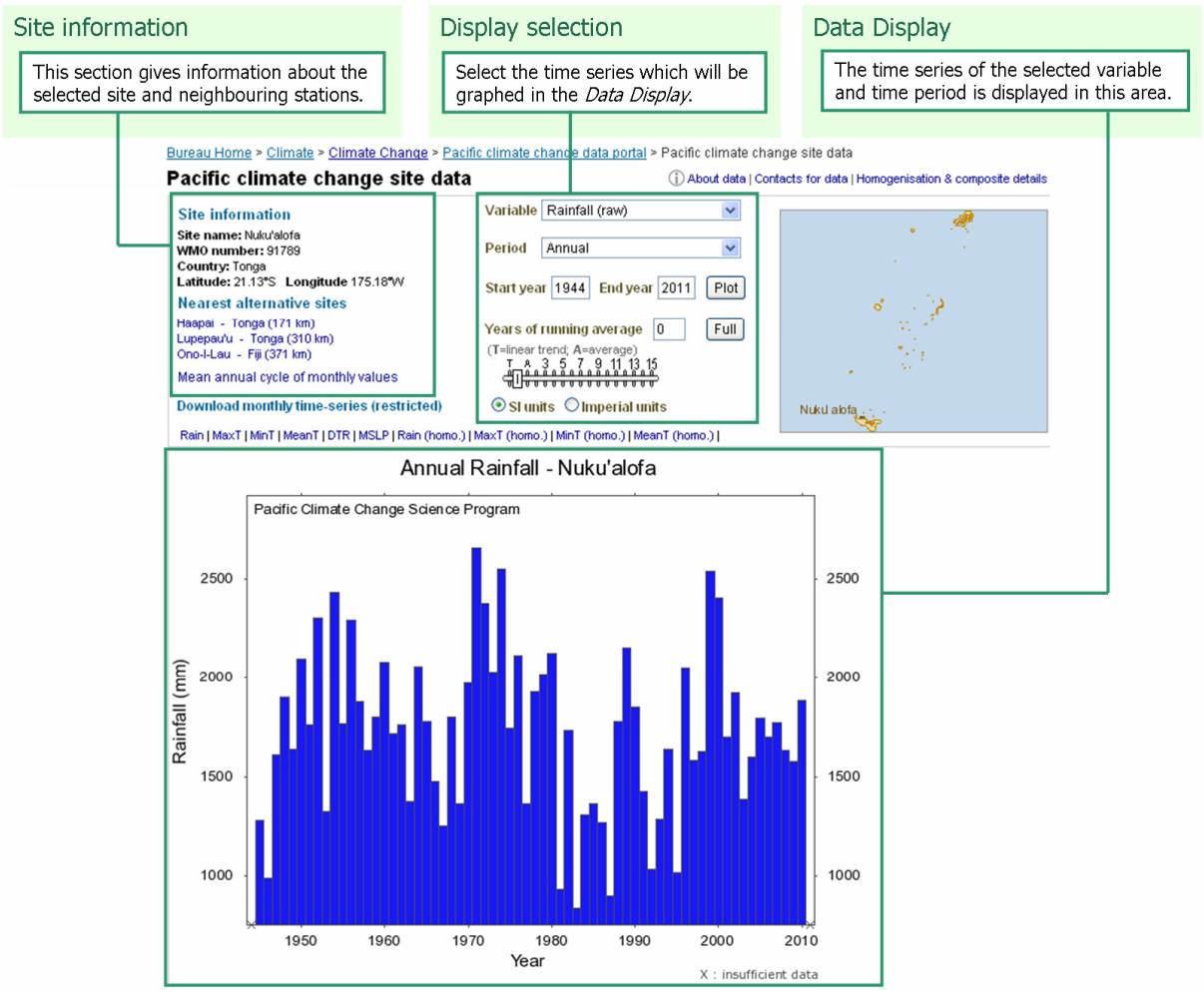

Figure 6: Orientation of the graphical interface of the Pacific Climate Change Data Portal.

The Pacific Climate Change Data Portal (Data Portal) graphical interface is divided into three main areas. The primary area is the *Data Display* with two secondary areas, the *Site information* and the *Display selection.* The orientation of the Data Portal is displayed in Figure 6 above.

2.1 Site information

The information about the station which has been selected from the map interface is displayed at the top of the *Site information* section of the Data Portal. This section contains fundamental information about the site including:

(i) Site name,
(ii) WMO number,
(iii) Country, and
(iv) Co-ordinates (latitude and longitude).

The 'Nearest alternative sites' to the station selected are also presented in the *Site Information* section with the station name, country and the distance from the current station. Clicking on a station name in the list will bring up that stations information and display the time series of that site in the *Data Display*.

Beneath the list of "Nearest alternative sites" there is the option to view the "Mean annual cycle of monthly values" for the selected site. Clicking this link opens up a new window showing a graph of the mean values for each month of the year at the selected station for the chosen variable as shown in Figure 7.

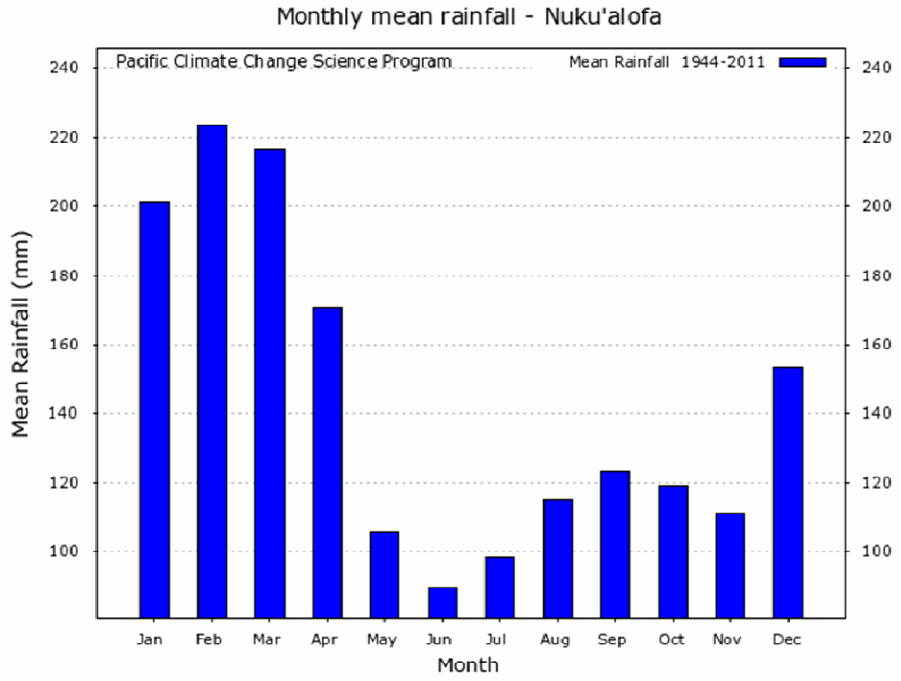

Figure 7: Example of the "Mean annual cycle of monthly values" graph.

2.2 Display selection

This section allows the selection of the parameters which will be graphed in the *Data Display*. The following describe the options available in the *Display selection*.

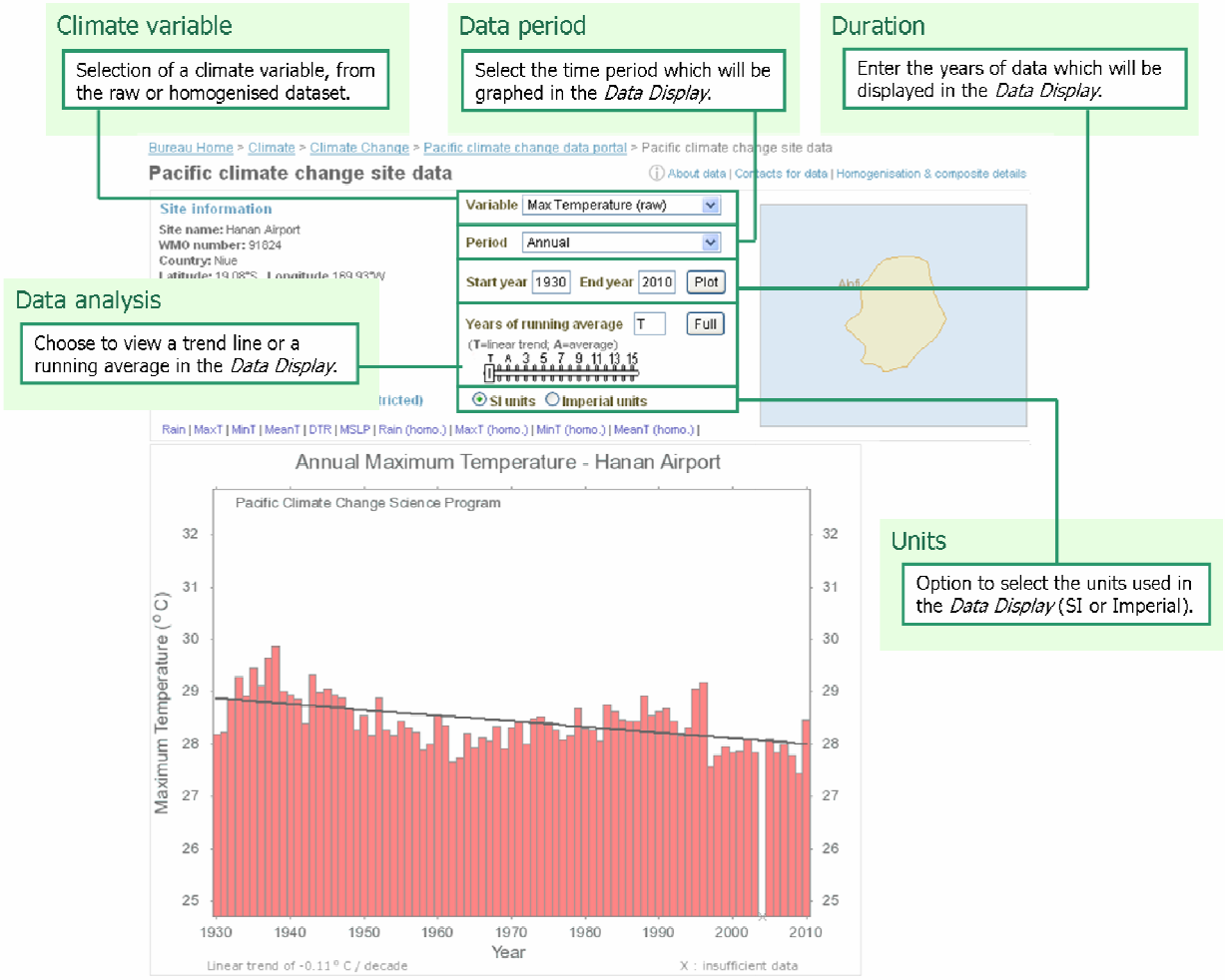

Figure 8: Functionality of the *Display selection*.

2.2.1 Climate variable

The first drop-down menu allows for the selection of the climate variable to be graphed and analysed in the *Data Display*. There are two dataset types – raw and homogenised. The raw datasets contain the data as it has been collected from the station and has not been adjusted for changes to the site over time. The homogenised datasets are those that have been adjusted using statistical methods to eliminate any non-climatic changes. The options available for selection from the drop-down menu are listed below.

(i) Rainfall (raw)
(ii) Max Temperature (raw)
(iii) Min Temperature (raw)
(iv) Mean Temperature (raw)
(v) Diurnal Temp Range (raw)
(vi) Mean Sea-level Pressure (raw)
(vii) Rainfall (homogenised)
(viii) Max Temperature (homogenised)
(ix) Min Temperature (homogenised)
(x) Mean Temperature (homogenised)
(xi) Diurnal Temp Range (homogenised)

2.2.2 Data period

The second drop-down menu allows for the selection of the time period of the data to be graphed and analysed in the *Data Display*. There are annual, seasonal and monthly options for presenting and examining the data. The options available for selection from the drop-down menu are listed below.

(i) Annual
(ii) Nov-Apr
(iii) Mar-Oct
(iv) DJF (December, January and February)
(v) MAM (March, April and May)
(vi) JJA (June, July and August)
(vii) SON (September, October and November)
(viii) Monthly

2.2.3 Duration

The selection of a 'Start Year' and 'End Year' allows for the interpretation of specific years within the *Data Display*. The 'Start Year' and 'End Year' are automatically selected based on the number of years of data available within the Data Portal. The values in the boxes can be edited to capture a shorter time frame within the default range. For any changes which are made to the 'Start Year' or 'End Year' to be reflected in the *Data Display* click on the "Plot" button. To view the entire dataset click on the "Full" button which will return the view to the default of the selected climate variable.

2.2.4 Data analysis

This option allows the analysis of data presented in the graph. Selection of the "Years of running average" can be done by entering a value in the box accompanying this phrase. A number between 2 and 15 can be entered into the box to create a line showing the running average on the graph. A linear trend can be viewed by selecting "T" and an average can be displayed by entering "A" into the box. Once a selection has been entered into the box it is necessary to click the "Plot" button to display the selection in the graphical interface. There is also a slide-bar underneath the "Years of running average" text which allows another way of selecting the analysis type desired. Sliding the marker along the line enables the selection. If no selection is made the default view is to not display any line type.

2.2.5 Units

The *Data Display* can be viewed in two different unit options depending on the preference selected.

(i) SI units – The International System of Units (SI) can be selected to view in the *Data Display* and uses degrees Celsius for temperature and millimetres for rainfall.

(ii) Imperial units – Provides an alternative to allow the *Data Display* to be presented using degrees Fahrenheit for temperature and inches for rainfall.

2.3 Data display

The climate data for the selected variable is graphed in the *Data Display* with the horizontal axis displaying the time period and the vertical axis the units of the selected variable (e.g. Maximum Temperature (°C)). Each bar in the graph represents the data for a specified year of record. Within the *Data Display* there are several key features which are explained in more detail below.

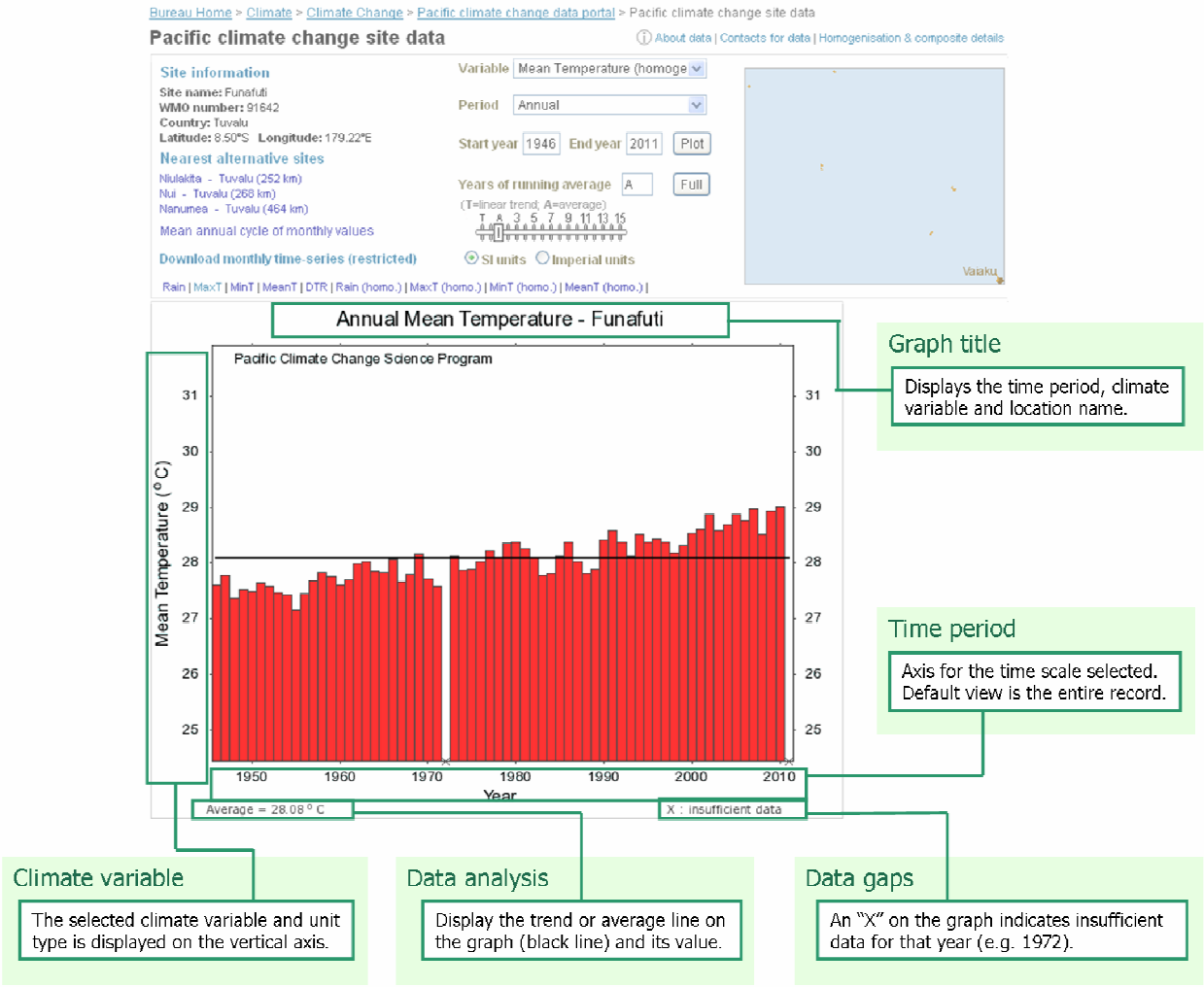

Figure 9: Navigation and layout of the *Data Display*.

2.3.1 Graph title

The graph title is generated based on the selection of the "Variable" and "Period" from the drop-down menus in the *Display selection* section of the Data Portal. The station name is also included in the graph title which means that the graph can be used as an image.

2.3.2 Climate variable

The climate variable selected is included in the graph title and is also stated in the vertical axis. The units used depend on the climate variable selected and the unit type selected in the *Display selection* section. The range presented on the axis automatically adjusts for the range of values

within the dataset for each site. The adjustment of the range presented allows the graph to be presented with clarity for ease of analysis.

2.3.3 Time period

The time scale for the dataset is presented along the horizontal axis of the graph with one bar presenting the data from the denoted year. The scale of the axis is adjusted to the range selected in the *Display selection* section of the interface. This allows the full record for the variable to be presented in one screen.

2.3.4 Data analysis

The functionality provided in the *Display selection* section allows a trend or average line to be plotted through the dataset presented in the *Data Display*. The value of the linear trend is also given in the bottom left hand corner of the *Data Display*, beneath the graph.

2.3.5 Data gaps

Where there is insufficient data (i.e. gaps in the data) for the selected variable and/or time period, no data for that year will be graphed and will be marked in the *Data Display* by the symbol 'X'. This often occurs at the start of the graph when the site has just been opened and may only have a few months of complete data for that year and hence insufficient data for the "Period" selected. The legend in the bottom right of the *Data Display* indicates the symbol for insufficient data.

2.4 Additional information

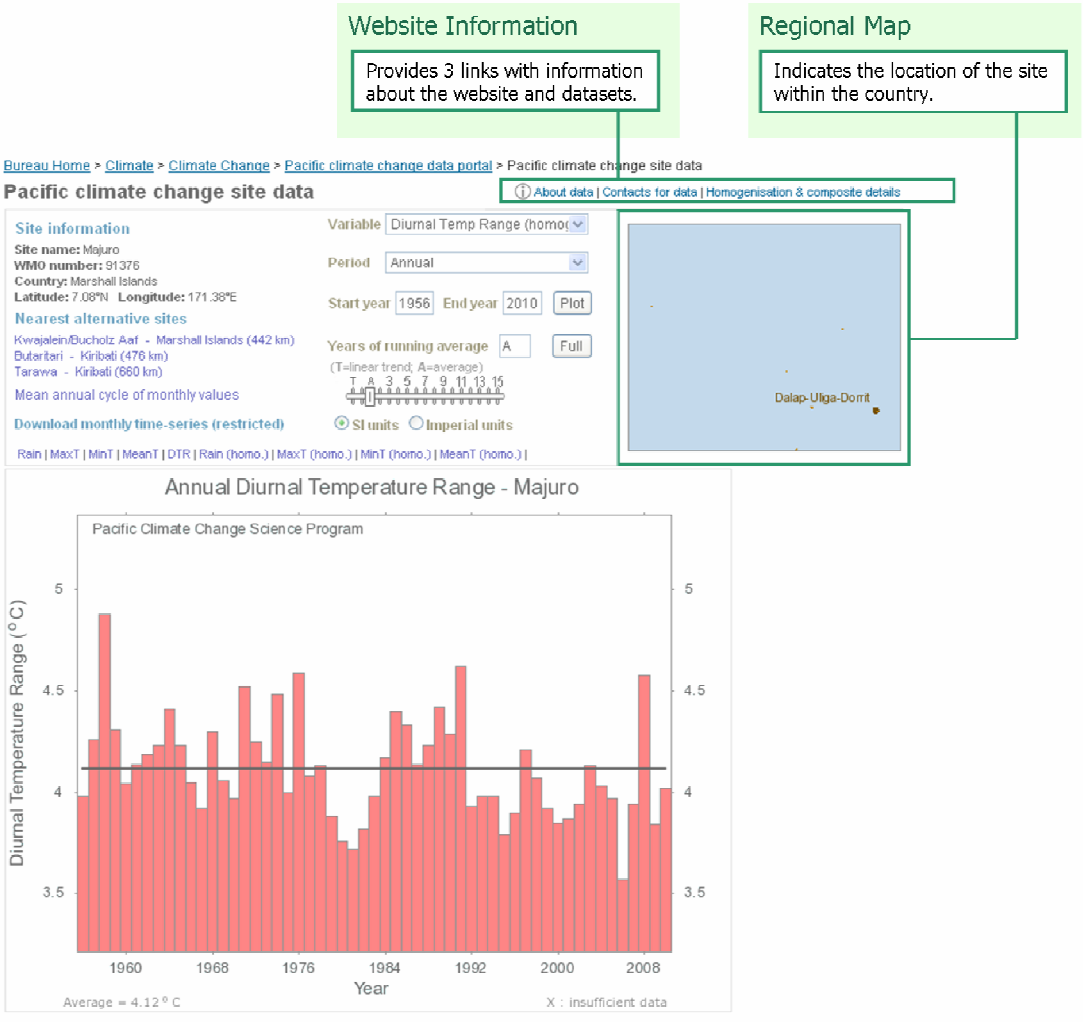

Figure 10: Additional information on the graphical interface view.

2.4.1 Regional Map

There is a *Regional map* overview (Figure 10) to indicate the location of the site within the country selected. The image shows the country selected in its entirety and thus for some countries there may be some overlap or what appears to be a zoomed out image.

2.4.2 Website Information

There are 3 links which provide information about the website located in the top right corner of the Data Portal graphical interface as described below.

(i) About data – This section provides information about the Data Portal including the project which funded the development and the copyright policy for accessing and acknowledging the data obtained from the Data Portal.

(ii) Contacts for data – This is a PDF document which provides the contact details (including telephone numbers and email addresses) for the organisation in each country responsible for the provision of the climate data which is presented in the Data Portal. This document is organised alphabetically by country name.

(iii) Homogenisation and composite details – A PDF document providing the adjustments for each station which has been used to homogenise the time-series is provided. The dates and the reasons for the adjustments at each site are listed in two tables, the first for temperatures, and the second for rainfall.

2.2 Downloading data files

The data used to create the graph presented in the *Data Display* is available to be downloaded and can be accessed on the left side of the interface above the *Data Display*. There is a link for each variable available in the "Climate Variable" section described in section 2.2.1. This option is restricted for use by those who have been provided with a password to access the data. Each country has ownership over their data and thus a request for access to the data files must be approved by the country. Once the relevant password has been obtained, click on the name of the climate variable to download. A new window will open and a pop-up requesting a username and password will appear. Entering the correct username and password will then lead to a pop-up providing the option to either open or save the file. The files will be downloaded as a Comma Separated Value (CSV) file containing the entire record of the selected climate variable for that station. If available both the raw and homogenisation datasets are available for download with the homogenised dataset denoted by the variable followed by the text "(homo.)". An example of the downloadable data file is shown in Figure 11.

# Monthly Rainfall - Willis Island (WMO Number 94299)													
# Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1924	26.2	23.1	187	353.6	100.3	89.6	41.2	53.9	15.6	8.6	46.3	100.6	
1925	119.9	265.1	249.4	198	4.4	52.8	13.5	9.1	36.4	17.3	89.3	14.1	
1926	273.2	278.1	177.1	65.8	45.8	120.8	5.4	1.8	55.2	2.9	16.4	132.5	
1927	230.9	475.7	200.5	359.3	12.1	2.9	82.9	46.8	28.3	2.2	32.9	88.7	
1928	10.7	286.4	325.7	80.6	7	16.3	25.7	6.1	13.4	20.9	117.2	61.1	
1929	291.9	303.8	101.5	192.9	37.7	90.1	7.6	5.9	7.8	0.3	5.6	8	
1930	373.3	97.4	171.3	21.1	313.8	319.7	28.5	16.5	8.9	72.4	5.6	21.1	
1931	48.8	200.7	81.9	205.2	50.5	101.5	26.3	3.3	0	6.1	170.7	80	
1932	164.5	119.3	195.9	66.8	61.2	19.8	4.5	7.1	1.8	4.8	8.3	94.3	
1933	11.9	262.2	153.3	81.3	41	114.4	31	13.7	206.4	102.3	36.8	450.8	
1934	475.8	241.7	61.1	510	55.4	18.9	10.3	6.6	1.1	1.8	13.8	0	
1935	28.7	651.5	265.8	58	130.1	18.2	116.9	10.5	0.3	9.1	3.6	3.3	
1936	42.2	305.3	130.1	163.2	31.3	154.5	149.4	10.3	22.3	1	3.6	99.9	
1937	42.4	83.1	303.1	19.9	6.4	59.2	51.1	6.9	13.3	0.5	4.7	182.1	
1938	406.3	298	62.3	144.9	161.8	16.6	186.4	27.7	5.8	10	82.9	193.8	
1939	113.2	684.5	227.4	142.4	94.6	95.9	4.4	0.3	3.6	48.5	13.5	19.4	
1940	135.2	469.3	241.3	239.7	24.5	72.1	51.6	107	25.7	20.9	17.3	23.4	
1941	143.2	403	148.5	328.1	74.5	16.9	17.2	6.5	2.9	4.6	37.2	47.4	
1942	15.8	99.4	7.4	76.6	22.4	13	73	4.3	41.1	8.6	7.8	117	
1943	132.2	195	109.8	69.3	51.8	209	2.5	0.5	39	4.1	2.8	19.5	
1944	127.1	115.2	178	27.3	9.6	24.9	32.9	22.3	2.3	40.9	12.5	130.5	
1945	269.7	137	487.3	58.5	24	79.8	49.8	4.2	3.9	40.6	24.7	41.9	
1946	101.3	158.7	82.6	63.5	10.4	2.5	0.5	8.1	0.5	1.6	2.1	18.1	
1947	86.3	156.7	97.1	50.6	106.6	9.9	8.1	6.2	4.3	17.5	6.9	18.5	
1948	144	112.9	101.2	51.7	7.3	50.8	11.2	31.8	0	19.1	42.5	54.2	
1949	182.7	102.7	132.5	510.7	11.5	9.1	23.9	19.3	23	165.8	12.7	25.1	
1950	275.9	274.2	160.3	206.5	8.2	65	252.8	48	41.9	49.6	93.7	293.6	
1951	324.1	159.9	51.8	49	85	10.8	15.8	14.8	51.2	1.3	39.7	65	
1952	368.1	132.3	343	21.6	3.4	47.5	8.1	32	20.8	56.1	77.7	18	
1953	645.2	162.8	519.4	50.3	20.1	6.4	8.6	63.8	25.1	1.3	25.9	150.1	
1954	380	213.6	299.2	234.4	38.1	32.8	56.4	32.5	64	16	26.2	22.6	
1955	69.3	166.6	156	63.2	155.4	91.9	7.6	30.5	82.3	69.1	278.1	9.4	
1956	208	247.9	248.7	146.6	90.9	97.3	8.6	20.6	48.5	4.3	37.1	183.6	
1957	530.1	553.7	76.7	90.7	133.6	42.9	13.7	18.3	9.1	88.9	15.7	11.9	
1958	191.5	216.7	196.6	160.3	53.3	150.6	17	43.9	1	0.5	14	46.2	
1959	431	651	604.8	133.9	34	41.7	25.4	16	26.2	6.6	9.1	44.5	
1960	107.2	199.4	266.7	27.2	84.1	24.4	28.4	5.3	1.3	9.1	13.8	115.2	
1961	82.8	20.7	38.4	27	63.6	1.4	2.7	17.2	2.3	17.4	30.3	59.2	
1962	148.3	323.8	50.6	31.5	3.7	12.4	24.4	0.6	6.7	1.9	43.7	217.1	
1963	428.7	333.5	209	256.7	17.7	31	0.8	9.1	5.4	27.6	2.3	4.2	
1964	181	36.4	355.5	89.8	116.5	48.2	51.1	110.8	13.7	87.5	80.6	94.6	
1965	173.4	47.8	65.7	133.4	18.4	42.4	25.2	18.9	4.5	16.8	12.4	29.1	
1966	12.6	94.5	15.9	10.8	17.1	18.8	6.7	23.5	0.3	10	3.3	27.1	
1967	92.3	158.3	203.8	33.9	163.1	154.5	57.9	2.7	10.6	6.9	16.6	37	

Figure 11: An example of a 'CSV' file download of monthly rainfall data for an individual station.

3. Step-by-step guide

A process for accessing climate data is described below.

1. Select the desired climate variable from the drop-down menu in the *Data* tab of the *Side Panel*.
2. Select the "Country of interest" from the drop-down menu also located in the *Data* tab of the *Side Panel*.
3. Click on a station (yellow dot) to reveal information in the "Station pop-up".
4. Check the station name at the top of the "Station pop-up" and if this station is the desired location click the "Show time series data" link to open the graphical interface in a new window and access the data for the nominated site. If the incorrect station has been selected click the ☒ button in the top right corner of the "Station pop-up" to return to the previous view.
5. The previously selected variable will automatically register in the "Variable" drop-down menu and is presented in the *Data Display*. The default period is the entire length of record for the variable and station selected.
6. To alter the years display in the *Data Display*, enter the desired time period in the "Start year" and "End year" fields and click on the "Plot" button.
7. To view a linear trend through the data enter "T" in the box next to the "Years of running average" and click the "Plot" button to update the *Data Display*.
8. To view the same variable from a neighbouring site listed under "Nearest alternative sites" click on the station desired from the list.
9. If the password and username to download data files has been obtained click on the link of the desired dataset under the section "Download monthly time-series (restricted)". Enter the username and password in the pop-up and select to open or save the data.

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